

Climate Change Impacts on Natural Resources in South Carolina

**Preliminary Findings of the
South Carolina Department
of Natural Resources**



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Climate Change Impacts on Natural Resources in South Carolina

**Prepared for South Carolina's Changing
Shoreline: Implications for the Future
A Coastal Information Network Workshop
Coastal Carolina University
Conway**

November 18, 2009



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Climate Change Impacts on Natural Resources in South Carolina

Objective:

**To Introduce Workshop Participants
to the Effort Underway to Document
Climate Change Impacts to Natural
Resources and Develop an Adaptive
Response Strategy**



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Coming Soon

DRAFT

**CLIMATE CHANGE IMPACTS ON
NATURAL RESOURCES IN
SOUTH CAROLINA**

December, 2009

<http://www.dnr.sc.gov>



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Climate Change Impacts on Natural Resources in South Carolina

Who Is Involved?

Representatives of all DNR Divisions:

Land & Water Conservation

Law Enforcement

Marine Resources

Outreach and Support Services

Wildlife & Freshwater Fisheries



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Climate Change Impacts on Natural Resources in South Carolina

Mission Statement:

The mission of DNR in response to potential challenges of climate change to our state is two-fold:

- 1. Identify issues and assess potential impacts of climate change on the natural resources of SC, and**
- 2. Develop an adaptive response strategy.**



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Climate Change Impacts on Natural Resources in South Carolina

Goals:

- 1. Gather factual information and data on how climate change may affect wildlife, fisheries, water supply and other natural resources within SC.**
- 2. Identify research monitoring and modeling needs required to assess impacts of climate change in SC.**



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Goals (continued):

- 3. Use factual information, data, research and modeling to determine what actions need to be taken to address climate change in SC.**
- 4. Identify opportunities to partner with other agencies and institutions where needed to accomplish the mission.**



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Goals (continued):

- 5. Identify ways for officials and citizens to assist in mitigation of or adaptation to natural resource impacts related to climate change.**
- 6. Position DNR to obtain available funding to assist in meeting the mission and goals related to climate change.**



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There is scientific consensus:

- **Earth's surface temp is changing, and it is human induced.**
- **Global avg surface temps have increased by approx 0.75° C since mid-1800s**



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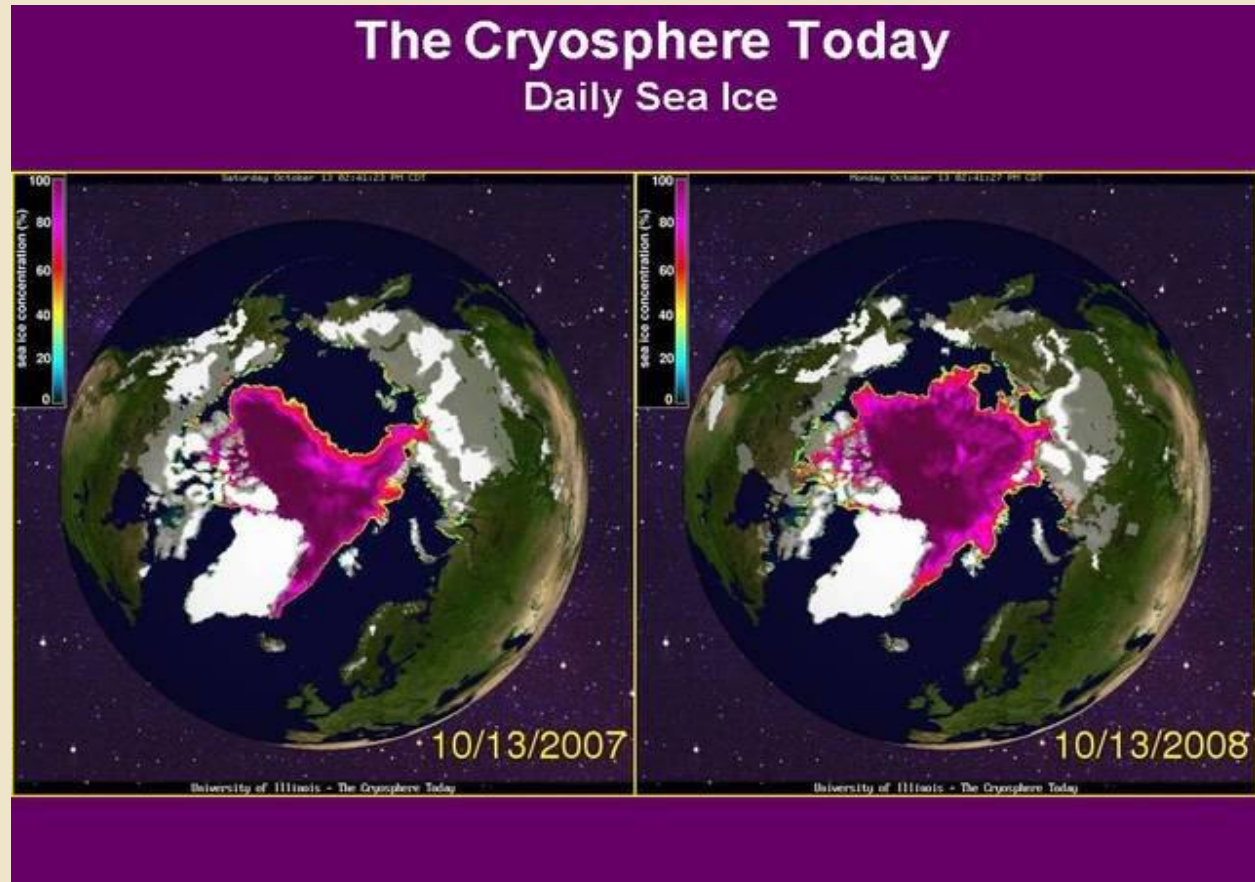
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In case anyone is skeptical:

- No where on earth is climate change so dramatically demonstrated than in the polar regions.
- Ice is in retreat.
- Even with policy shifts, avg annual global temp is projected to rise 1° C within 20-25 yrs



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What Do Climate Models Predict for SC?

It is hard to drill down a continental model, but



**We think it is going to be . . .
Slightly wetter and cooler on average!**

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**Problem is that we probably won't get the
rain and temperatures this region and
state has enjoyed for many generations if
for not many centuries.**

**More
Heat
Waves!**



Remember August 2008?



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Problem is that we probably won't get the rain and temperatures this region and state has enjoyed for many generations if for not many centuries.

**More
Floods!**



North Georgia – October 2009



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Problem is that we probably won't get the rain and temperatures this region and state has enjoyed for many generations if for not many centuries.

More Droughts!

- **60K a of lake dry**
- **No hydro in Santee**
- **Critical low flow in Cooper**
- **Businesses closed**



Lakes Marion and Moultrie



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Problem is that we probably won't get the rain and temperatures this region and state has enjoyed for many generations if for not many centuries.

**More
Low
Stream
Flow!**



Broad River 2007-08: record low flow, minimal hydro generation & low water quality



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**Problem is that we probably won't get the
rain and temperatures this region and
state has enjoyed for many generations if
for not many centuries.**

More Extremes!



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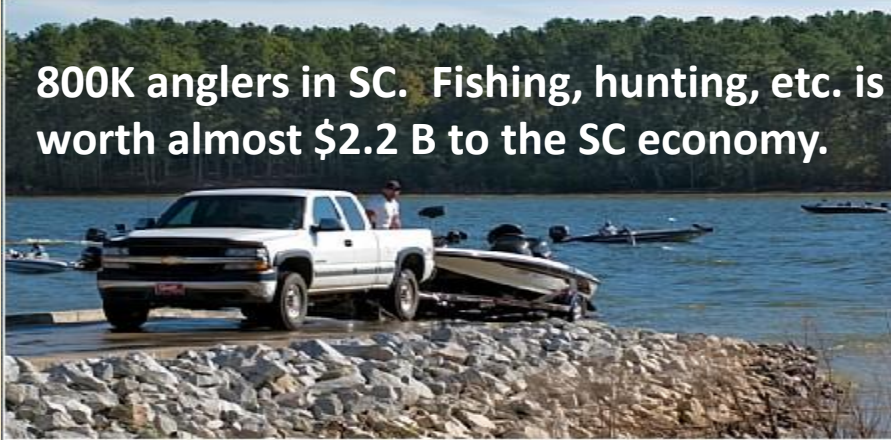
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Water Issues



Water is important to SC – most outdoor recreation is water based!

800K anglers in SC. Fishing, hunting, etc. is worth almost \$2.2 B to the SC economy.



Overall outdoor recreation and management contributes > \$30 B to the SC economy.



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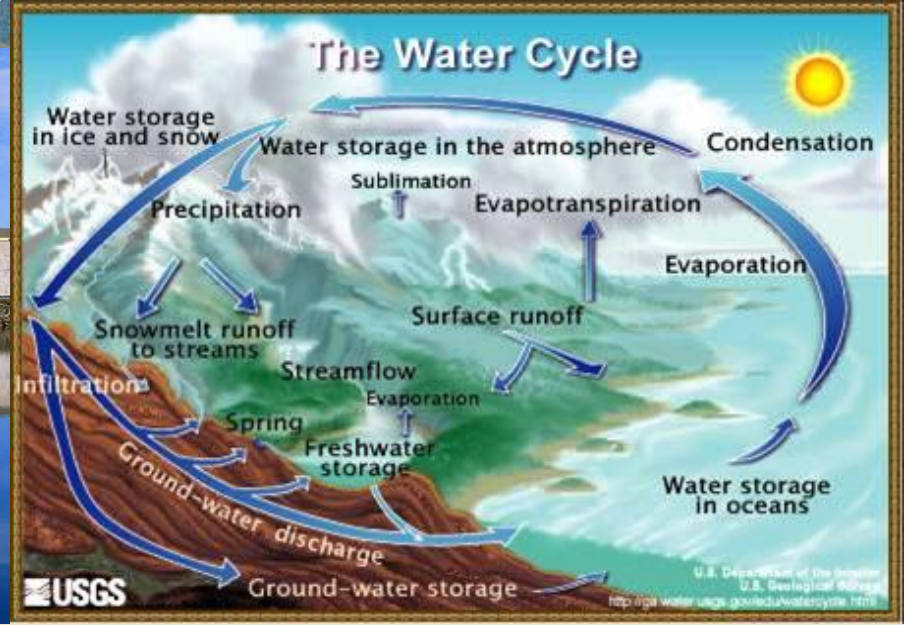
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Water Issues



Maybe too much attention has been focused on polarizing issues and not water quantity and quality!

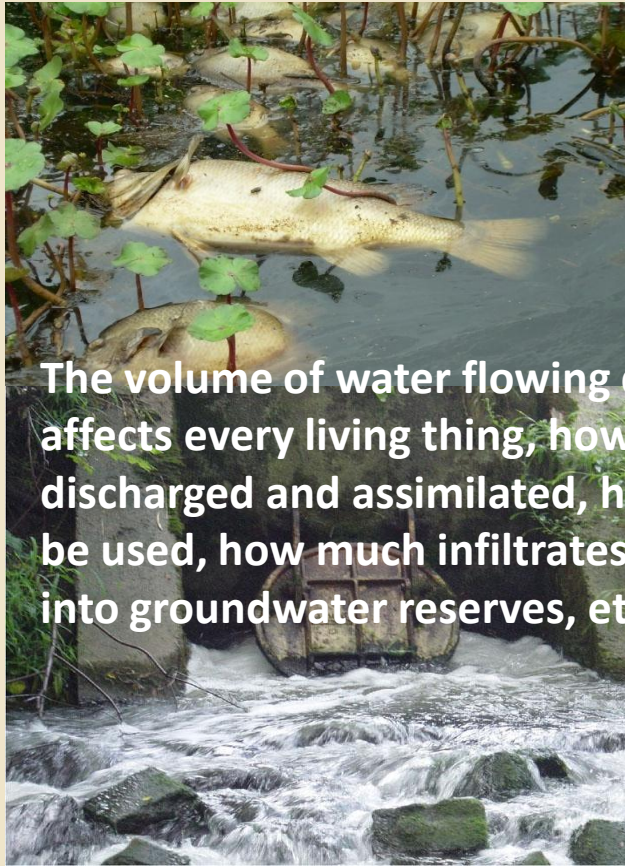


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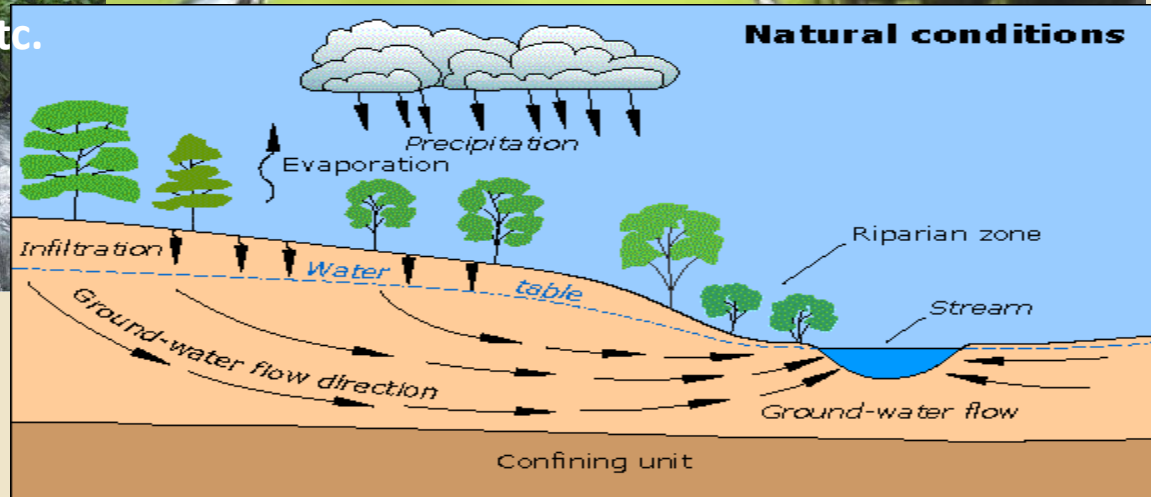
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Water Issues



The volume of water flowing downstream affects every living thing, how much can be discharged and assimilated, how much can be used, how much infiltrates into groundwater reserves, etc, etc.



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Sea Level Rise

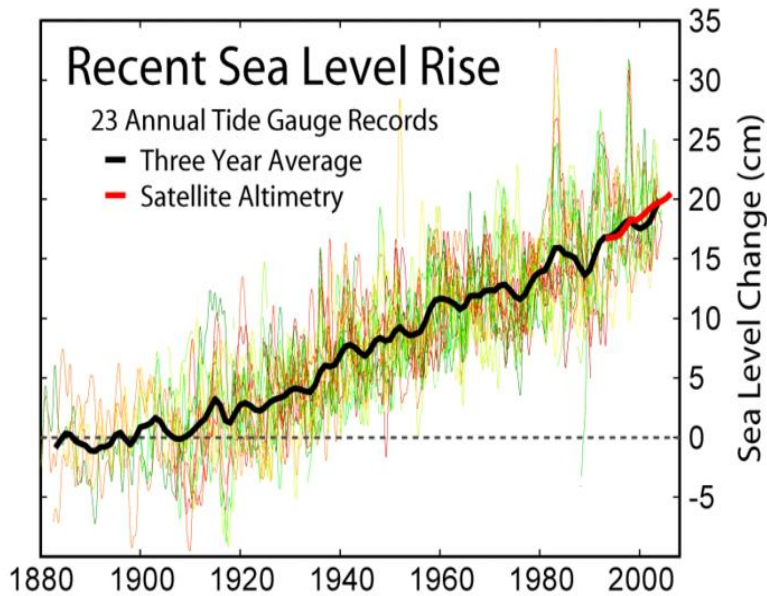


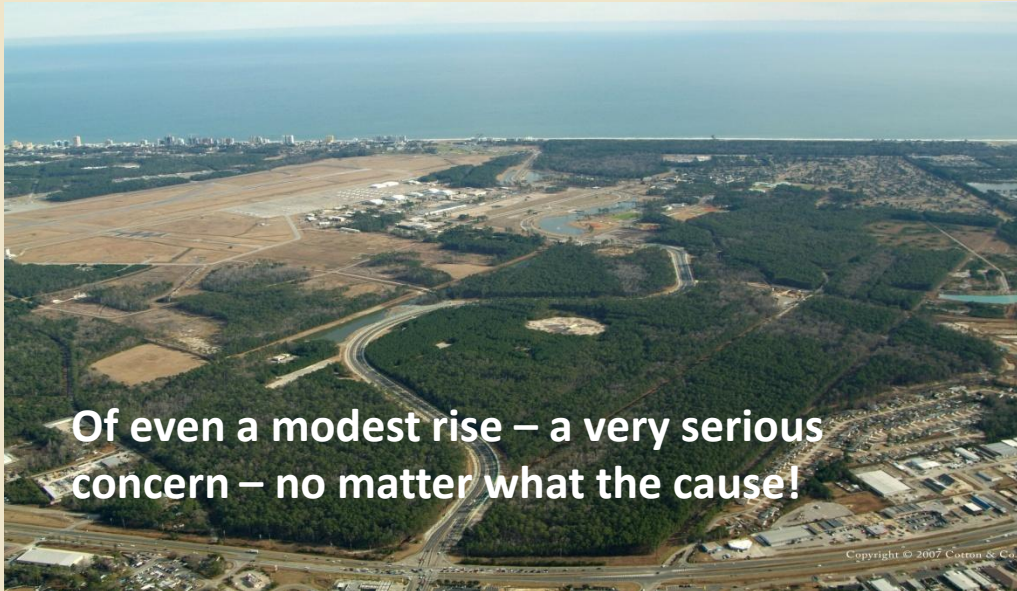
Photo by Dave Saville / FEMA News Photo

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Sea Level Rise



Of even a modest rise – a very serious concern – no matter what the cause!



Will impact many species and habitats – some already vulnerable!



Dealing with sea level rise will be costly!



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Species Impacts

There will be:

- 1. Winners – those that can adapt, mostly by having a wider range or tolerance or by having the ability to move.**
- 2. Losers – those that cannot adapt, with low tolerance for temp and pH change or those that cannot move.**
- 3. Some species may be relatively unimpacted.**



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Species Impacts

Winners



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Species Impacts

Losers



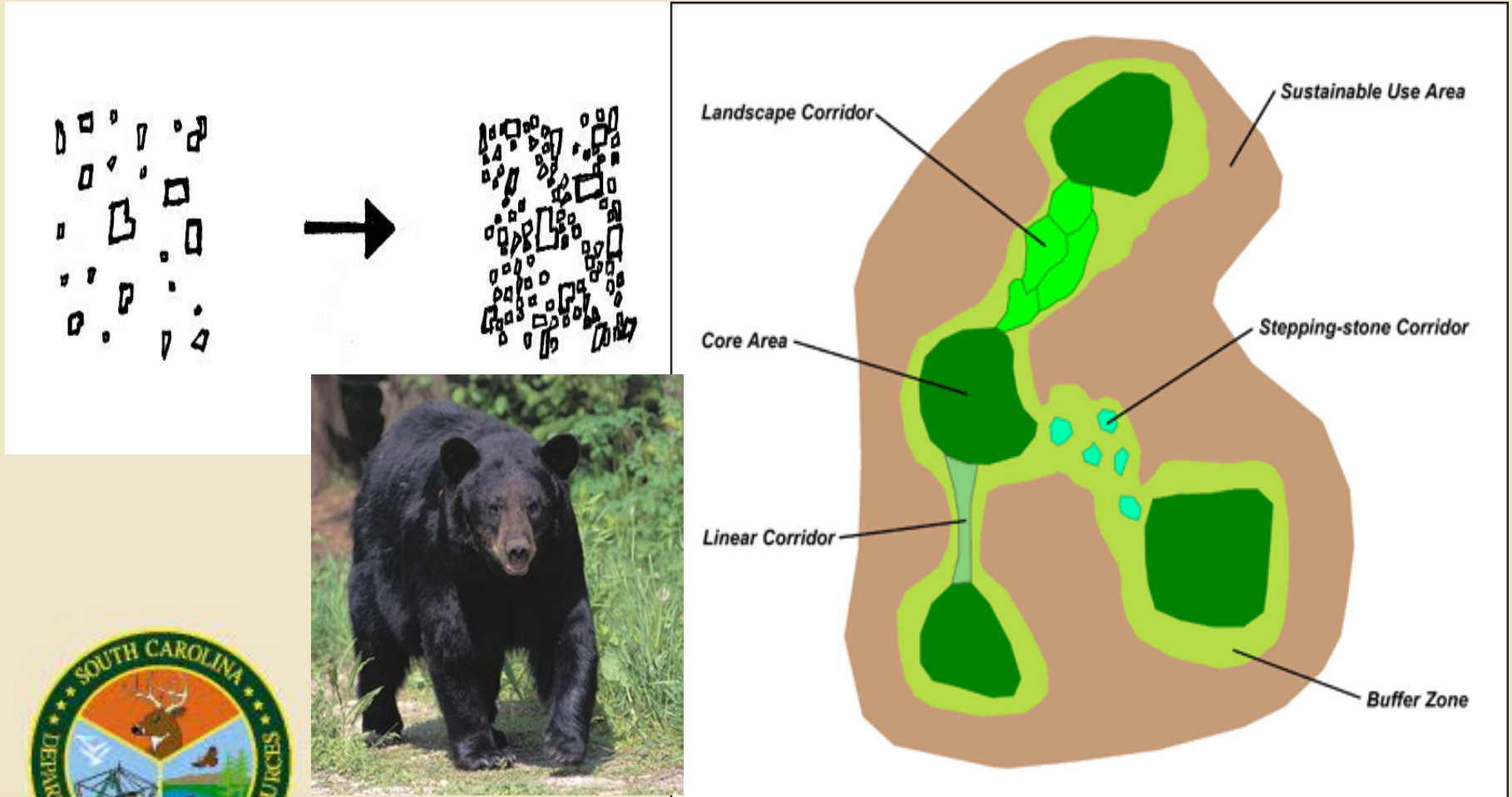
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Habitat Impacts

Habitat Fragmentation



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Habitat Impacts

Ecosystem Services – It Is Worth Billions!

Food & Water

Cleans the Air

Flood Attenuation

Beach Re-nourishment

Pollution Assimilation

Pest Regulation

Nutrient Recycling

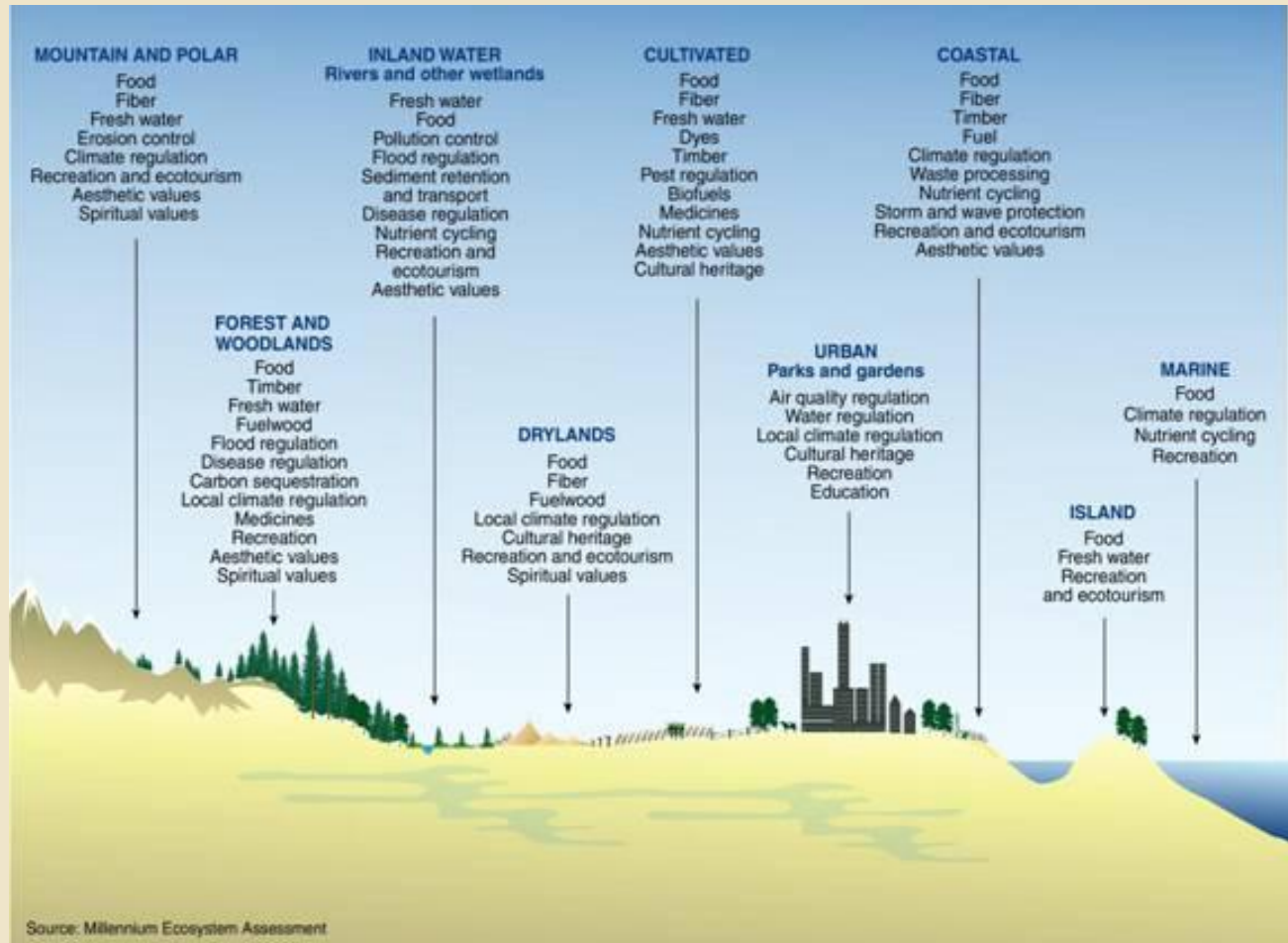
Carbon Recycling

Draws Tourists

Provides Recreation

Provides Jobs

More!!!



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Habitat Impacts

Something perhaps not thought about yet!



Environmental Justice communities likely will be disproportionately impacted by climate change! Climate change induced environmental impacts will have to be calculated under NEPA.



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Climate Change Impacts to Natural Resources Where Do We Go From Here?

- **Seek Funding**
- **Document What the Science Says**
- **Embrace the Uncertainty of Not Ever Knowing Enough**
- **Focus on Water Rather than Politics**
- **Triage and Press On**



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Summary of Likely Significant Impacts:

- **Surface Water**
- **Sea Level Rise**
- **Invasive Species**
- **Endangered Species**
- **Shifts in Spatial Distribution**
- **Ecosystem Services**



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Climate Change Impacts to Natural Resources For Additional Information:

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